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ABSTRACT

This presentation shows how to deliver audio/video (AV) lectures to online students using relatively inexpensive AV software (i.e., Camtasia Studio) and the standard Blackboard interface. The first section describes two types of production programs: presentation media converters and screen capture utilities. The second section covers making an AV presentation with Camtasia Studio, focusing on Camtasia Recorder (a screencam that records videos as Audio Visual Interleaved (AVI) files, and Camtasia Producer) an editor that produces videos in Flash, Windows Media, RealMedia, QuickTime, and other formats. The third section presents tips for producing AV files using Camtasia Studio. Several screenshots are included. (MES)

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Making Your Blackboard Courses Talk!

By Tim M. Burcham

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Making Your Blackboard Courses Talk!

By: Tim M. Burcham

Track 2 - Innovation and Future Implementation in Instructional Technology
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Abstract

The use of Blackboard and WebCT have greatly enhanced the ability of instructors to deliver educational content to students. The use of slides and other graphical software has improved the ability to deliver quality content to users. However, slides and other static web-based educational media, sometimes fails to capture the knowledgebase of the instructor, e.g., the verbal commentary associated with classroom lectures. This presentation will show you have to deliver good quality audio/video lectures to your online students using relatively inexpensive A/V software and your standard Blackboard interface.

Proceeding

Introduction

Today, many faculty are proficient in the use of Microsoft PowerPoint presentation software (or a similar product) for developing lecture outlines, visualizations, and related class materials. Course management systems (CMS), such as Blackboard and WebCT, provide a tremendous platform for faculty to upload and distribute Web-based educational materials. The distinction of Web-based materials and standard digital media is blurring, e.g., most software is capable of outputting to a Web-based format.

Unfortunately, PowerPoint presentations remain basically static, e.g., the student flips through the slides gleaning information without the benefit of the instructor's verbal comments on the topics being presented. This severely limits the conveyance of knowledge from the instructor to the student. In this format, none of instructor's anecdotal experiences can be conveyed, unless they are expressly outlined in the presentation.

If Web-based instructional presentations included the instructor's verbal lecture comments, a "static" slide show would become a "dynamic" presentation, capturing all of the instructor's emotion, tempo, and anecdotal information. To understand how powerful the human voice is, we need look no further than standard radio broadcast. For years, the human voice has captivated us, entertained us, and conveyed vital information through newscast. That medium is still viable today, because the human voice conveys more than words, it conveys all of the human emotions and passions.

Today, software and hardware are available that allow the instructor to include the "verbal lecture" synchronously with the electronic presentation. Standard streaming media formats such as RealPlayer,

Windows Media Player, and Flash all allow audio/video presentations to be conveyed with minimal computer skills. Software packages such as TechSmith's Camtasia, Macromedia's Breeze, and Impatica, Inc.'s Impatica allow the instructor to record audio lecture comments synchronously or asynchronously to an electronic presentation. For instructors of "online courses," these tools represent a breakthrough conduit for knowledge transfer through the World Wide Web.

Purpose

This paper serves as a primer for developing audio-enhanced presentations using Camtasia Studio v 1.0.1 (TechSmith, Inc.).

Types of Production Programs

When choosing a software package for adding audio content to PowerPoint slides, there are two basic types of software that can accomplish this task. For our purposes, these are defined as screen capture utilities (SCU) and presentation media converters (PMC). Examples of SCUs are: Camtasia Studio v 1.0 (TechSmtih, Inc.) and CaptureEze Pro Screen Capture 8.08 (Application Techniques, Inc.). Examples of PMCs are: Breeze (Macromedia, Inc.) and Impatica (Impatica, Inc.).

Presentation Media Converters (PMCs)

These software programs allow the user to convert presentations in PowerPoint to a Web-based streaming compatible format. For example, Impatica allows the user to convert any PowerPoint presentation, including any associated recorded audio, to a Web-based streaming format with up to 95 percent reduction in base file size. Impatica offers converters for PowerPoint and Macromedia's Director. These are input specific, i.e., one must purchase Impatica for PowerPoint or Impatica for Director. These software packages are an excellent choice if the majority of one's presentation materials are in PowerPoint. The primary weakness of this type of product is their one-dimensional nature, e.g., you can convert PowerPoint exclusively. If you want to demonstrate something that isn't conducive to incorporation into PowerPoint, this type of product may not be your best choice.

Screen Capture Utilities (SCUs)

Screen capture utilities (SCUs) do exactly what the name implies. They capture exactly what is displayed on the computer's video screen. Products such as Camtasia, allow the instructor to record real-time audio during the screen capture. This type of software is ideal for developing video help files. While these programs have enjoyed most of their success in recording short help clips (5 minutes or less), Camtasia will allow recording sessions up to about 20 minutes in length (length may vary due to frame capture rate, etc.). This means that it can be used to create audio enhanced lecture materials. Unlike the PMCs, the SCUs are equally at home recording Microsoft Excel, AutoCad, Web browsers or any other application. Anything that is displayed on the screen is captured in the video. This allows the instructor to incorporate information from a variety of sources. For example, the instructor may begin the lecture using PowerPoint slides; switch to a real-time example in Microsoft Excel; then back to the PowerPoint. By incorporating digital ink software (software that displays hand written text on the computer monitor), complex mathematical equations, chemical formulations, or proper pen strokes for constructing a letter in the alphabet can be recorded. With Camtasia Studio, the instructor can also synchronously record verbal comments during the video capture sequence. The primary limitation of this type of software is complexity in mastering the various aspects required to record, compress, and mount presentations, i.e., the learning curve is steeper than PMCs.

Making an Audio/Video (AV) Presentation with Camtasia

Camtasia Studio is a video screen recording studio made up of five applications that let you record, edit and share videos of activity on your Windows screen. The five applications in studio include:

- **Camtasia Recorder**

Camtasia Recorder is a screencam that records all activity - including narration - on your Windows PC screen. Camtasia Recorder records your screen videos as Audio Visual Interleaved (AVI) files.

- **Camtasia Producer**
  Edit your AVIs with Camtasia Producer. Videos can be produced in Flash (SWF), Windows Media, RealMedia, QuickTime and other formats.
- **Camtasia Effects**
  Add captions, arrows and graphics to your AVIs with Camtasia Effects.
- **Camtasia MenuMaker**
  Create custom menus for distributing your videos and related materials with Camtasia MenuMaker.
- **Camtasia Player**
  Preview Camtasia Studio videos and share them in AVI format with Camtasia Player.

This paper will limit discussion to Camtasia Recorder and Producer. These are the primary components necessary for producing audio-enhanced video lectures.

Camtasia Recorder

Camtasia Recorder is basically a screencam that records all activity, including audio narration. Figure 1 shows the opening Camtasia Recorder screen. The user can define four different capture modes that include: screen (capture the entire screen), window (capture the active window), region (capture a user defined zone by dragging a rectangular zone with the mouse), and fixed region. For the fixed region option, the user can "select" the capture area by dragging a highlighted rectangular band around the zone to be recorded or define a specific width and height for the capture area, e.g., 640 x 480 pixels.

The user can adjust microphone and volume setting in the Tools – Options menu. The default audio recording format is PCM at 22.05 kHz, 16-bit, mono. Other audio formats are available; however, TechSmith recommends the default settings for optimum recording quality and minimal file size. Other settings included in the Tools – Options menu include File, Hotkeys, Live, and Program. The "File" tab allows the user to select the Output Folder, as well as defining a Temporary File Folder. The "Hotkeys" tab allows the user to select which keys are programmed for Record/Pause, Stop, and Screendraw commands. The "Live" tab allows the user to select the capture frame rate for live Internet broadcast. Finally, the "Program" tab allows the user to select a multitude of "Capture Options" to suit user preferences.

The microphone icon toggles the microphone input on and off. In addition, Camtasia records simulated keystroke and mouse button sounds, if the appropriate icons are toggled. During the recording process the user can choose whether to have mouse movements and mouse clicks highlighted.

To begin a recording session the user first defines the area of the screen to capture by clicking the down-arrow next to the record button. The Fixed Region mode allows excellent versatility. By sizing applications to fit inside the Fixed Region recording window prior to beginning the session, multiple software packages can be recorded simply by toggling from one application to another. For example, one may be recording a lecture from PowerPoint that refers to an Excel spreadsheet. By simply pressing F9 to pause the recording, the user can then toggle to the Microsoft Excel application window that is layered behind the PowerPoint application window. Once the Excel application window is properly framed in the capture zone, the F9 key is pressed to continue the recording process. Alternatively, the Fixed Region screen capture rectangle can be moved to any area of the screen, while recording or paused. This provides tremendous versatility to the instructor, as they are free to switch between various applications during any given lecture recording session. Switching between applications can be repeated as many times as needed; however, the recording process is serial, e.g., once a recording session has began, it cannot be reversed during the session. Any edits (audio or video) must be done after the recording session is completed (post processed). Thus, it behooves the instructor to have lecture comments organized prior to the recording session. A key factor here is the "Pause" key F9. The instructor can pause the recording process at anytime. For instance, after recording lecture comments on a given PowerPoint slide, the instructor can "Pause" the recording process, look at the next slide, compose the lecture comments, and then proceed with the recording by pressing F9 again. Once the instructor becomes accustomed to the limitations imposed by serial recording sessions and accepts that verbal

mistakes will happen, the recording process becomes second nature.

To end a recording session (audio and video), press the F10 key to "Stop" the recording. Camtasia will ask the user for a filename for the newly created file. These files are stored in Audio Visual Interleaved (AVI) format. This format can be thought of as the "master copy," e.g., this is the master file from which all other copies will be made. The AVI format is uncompressed, and as such, tends to be very large. For example, a typical 15 minute lecture using PowerPoint slides with audio commentary may have a file size of 40 MB or more. This brings the user to the next step in the process, namely compressing the AVI file with Camtasia Producer.

Camtasia Producer

Once an AVI file has been created, the next step is to output the AVI file in a standard compressed format suitable for streaming. Camtasia can output files in the following formats: RealMedia streaming media file (*.rm), WindowsMedia streaming media file (*.wmv), Macromedia's Flash (*.swf), Camtasia for RealPlayer (*.camv), and Apple's Quicktime Movie (*.mov).

Each format has advantages and disadvantages. For example, WindowsMedia (*.wmv) files are very compact with excellent audio quality; however, this format is not conducive to capturing with photography, i.e., it works best when recording standard software packages with limited color pallets, such as Excel and PowerPoint. If the AVI contains photography or other images with large color pallets, the output may result in a blank screen during playback. This can be overcome by turning the hardware acceleration off in the Windows Media Player; however, this task is troublesome for the end user. Using Camtasia Producer to output Macromedia's Flash format, on the other hand, does not present problems when converting media containing photos. The audio quality and file size will be somewhat larger than a similar file output in the WindowsMedia format. When outputting in RealMedia format, three (3) files are created: an audio file (*.au), a RealMedia file (*.rm), and an *.smil file that is used to link the audio and video files during playback. Unless the instructor is mounting these files on a Real server and linking the address of the streaming media in the Course Management System, this can be cumbersome, particularly when compared to Flash and WindowsMedia formats which create a single output file.

Figure 2 shows the Camtasia Producer application window. To begin the production process, one simply drags the AVI file onto the Storyboard. Next, select File – Produce Movie. This will bring up the Produce movie application window as shown in
Figure 3. Click the pull down menu under Movie File Format. Then, select the Movie File Name in the dialog box or use the "browse" folders option to select the location for the output file. Finally, click the Options button located at the bottom of the Produce Movie application window. This will bring up the Production Options application window as shown in Figure 4. Options for color pallet, frame rate, audio format, audio attributes, and playback controls are selected in this window. This screen is very important since the selections chosen here will have a dramatic effect on the file size of the output file. Using 16-bit color versus 32-bit color will generally produce smaller files. However, if photography is contained in the captured AVI file, 32-bit color may be necessary. If your PowerPoint slides feature gradient backgrounds (black to blue, etc.); change them to a monotone background color. This will reduce the output file size considerably (up to a 50% file size reduction depending on the material being captured). The Audio Attributes play a large role in output file size, particularly when outputting in Flash format. In general, use as low a frequency as possible to produce acceptable audio quality. Voice narration is generally acceptable using mono output settings. Selecting stereo will typically double the output file size. In general, the MP3 Audio Format with 11.025kHz, Mono, 8kbits/sec or 11.025kHz, mono, 16kbits/sec produces acceptable audio output.

Once all of the Production Options have been selected, click "OK" to return to the Produce Movie application window. Click the "Produce" button to begin processing the AVI file placed on the Storyboard. Depending on the size of the captured AV file, this process may take a considerable amount of time, e.g., 5 minutes or more. When the output process completes, the "produced" file will begin playing automatically (if you selected "Preload Movie" in the Production Options application window). Play the video and determine if the video and audio quality is acceptable. If not, then produce the video again using different settings in the Production Options.

Uploading AV Lecture

The final step in the process is uploading the produced AV file to your Course Management System (Blackboard or WebCT) or Webpage. Again, the type of output files you choose will depend on whether your server has streaming output capability (Real Server, Windows Media Server, etc.). If your server has these capabilities, then contact your IT professionals for linking streaming media from your Course Management System.

Tips for Producing AV Files using Camtasia Studio

1. Select the smallest capture window possible to faithfully convey what is intended in the AV file. The more pixels you capture in the video, the larger the ultimate file size will be. Generally, screen captures with a size of 640x480 or 800x600 pixels are adequate. Remember, if you have a 1024x768 pixel display and you capture the entire screen, you are capturing 1024x768 pixels.
2. Produce a sufficient number of demo files to correctly adjust the microphone for good audio playback. Creating a 20 minute audio enhanced video only to find out that the microphone settings were too low will result in a retake. Remember, the AVI file is the master file. If it has poor audio, then any file produced from it will have even poorer audio quality. Make sure the AVI files you produce have excellent video and audio quality.
3. Once AVI files are created, experiment with the various output formats that Camtasia provides. For optimum file size reduction, choose WindowMedia (*.wmv) format. For lossless video and good audio quality choose Flash (*.swf) format. If you have a Real Server at your location, outputting in RealMedia (*.rm) may be advantageous. For the majority of the authors AV compilations, *wmv and *.swf formats are used. Both of these result in a single output file and they are both universally compatible with today's browsers (through free browser plug-ins).
4. Use a quality boom microphone for recording your voice during video capture. The clip-on microphones that often come packaged with new PCs produce poor quality audio. Headset boom microphones in the $15 to $20 dollar range produce good audio. After all, the beauty of this process is sending your voice along with the presentation.
5. In general, you can only record 20 minutes of audio/video (AV) material in one session (Flash format has a maximum 16,000 frames). This number will go down if you have the capture frame rate set higher than 1 to 3 frames per second. Experiment with the capture frame rate and production frame rate and use the lowest value that gives acceptable output. If you need one hour of lecture time, break the lecture into three 20-minute or four 15-minute segments. In Flash format, a 15 to 20 minute lecture will have a file size of about 4 to 6 MB. If your students are using 28.8Kbs Internet connections, this is the largest file size that is manageable from a download standpoint. If your students have access to computers with a T1 or DSL connection, have them download the AV lectures on that machine and burn them on a CD for later playback.
6. Incorporate a pen-based digitizer to bring handwritten lecture notes to your students. Devices such as the InkLink from Seiko Instruments and Logitech's IO Personal Digital Pen allow handwritten notes to be easily transferred to a digital environment. The author uses the InkLink, which clips onto a standard paper notepad and transfers any written information to a digital notepad. These digital notes can be saved in numerous web-friendly formats. Most importantly, Camtasia records each pen stroke (digital chalkboard) and your verbal explanation of the information being presented. These input devices are particularly well suited for describing mathematical equations. In foreign languages, the instructor can record the proper pen strokes for a particular letter or word along with the proper pronunciation.
7. Practice makes perfect. The first time you place the headset microphone on and begin recording your comments on a PowerPoint slide presentation, you will be conscious of verbal mistakes. Remember, the F9 key allows you to "pause" between slides. Use the F9 often. The end user will not know how many times the presentation was "paused," e.g., it will sound seamless when played back. Relax and accept that you will make some mistakes during a recording session. These mistakes occur in the normal classroom lecture environment, so they will occur during a typical recording session. When recording a presentation, imagine that you are lecturing in a standard multimedia classroom environment. Anticipate questions that might arise and address as many of these questions as possible in the presentation narration. Remember, you have more than one shot to answer questions using this technology.

8. Have fun! After becoming accustomed to the AV recording process, you will develop a sense of accomplishment and satisfaction that rivals your classroom experiences.

Summary

The use of audio/video screen capture utilities, such as Camtasia, provides a tremendous tool for developing educational materials that more faithfully capture the classroom experience. When these files are output in streaming formats (Real, Windows Media, Flash, etc.), they can be utilized by students with disparate bandwidth connections. Today's software packages allow the instructor to capture both visual and auditory components. The goal of any teacher is to convey knowledge. The ability to share anecdotal information with each lecture segment extends the learning experience and provides a better conduit of knowledge transfer.

* Disclaimer: The mention of product names does not imply an endorsement by the University of Tennessee at Martin or the authors of this paper. Product names are included for identification and demonstration only.

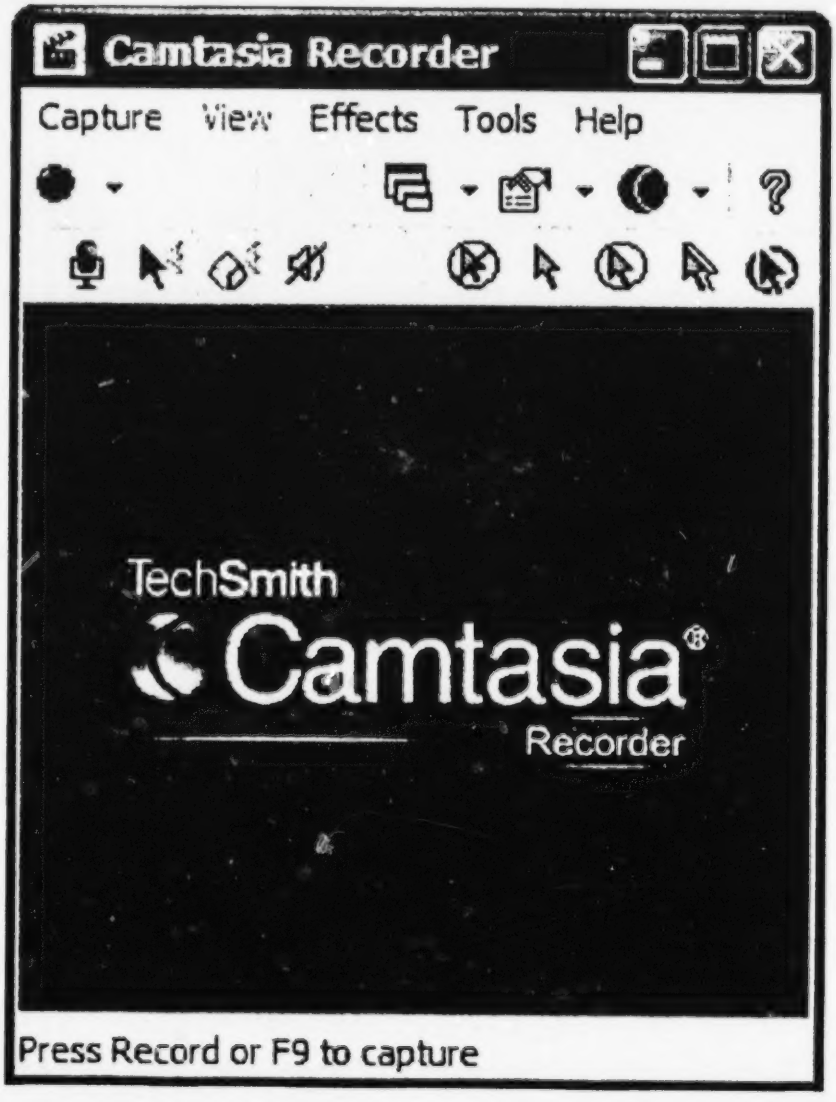

Figure 1. Camtasia Recorder application window.

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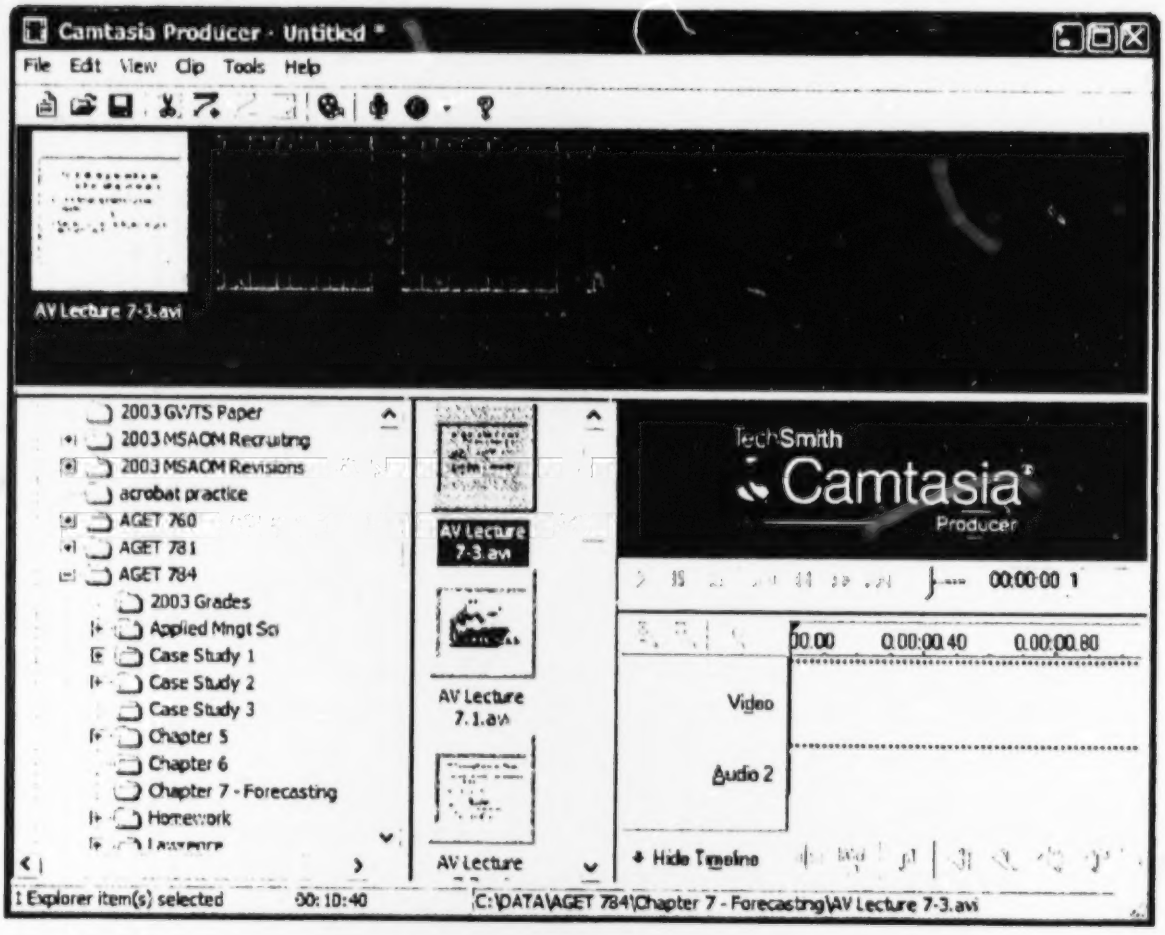

Figure 2. Camtasia Producer application window.

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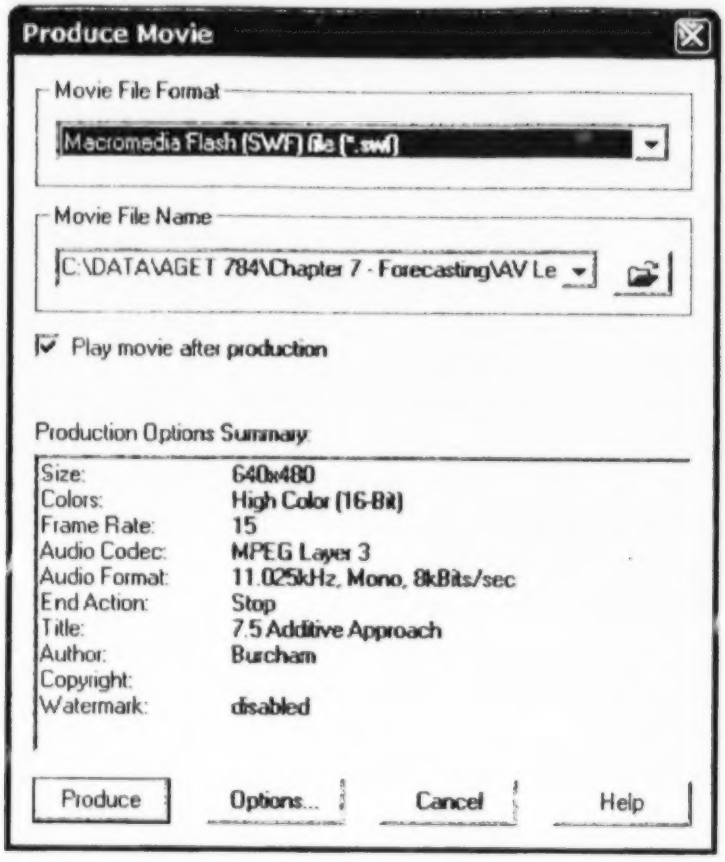

Figure 3. Camtasia Producer - Produce Movie application window.

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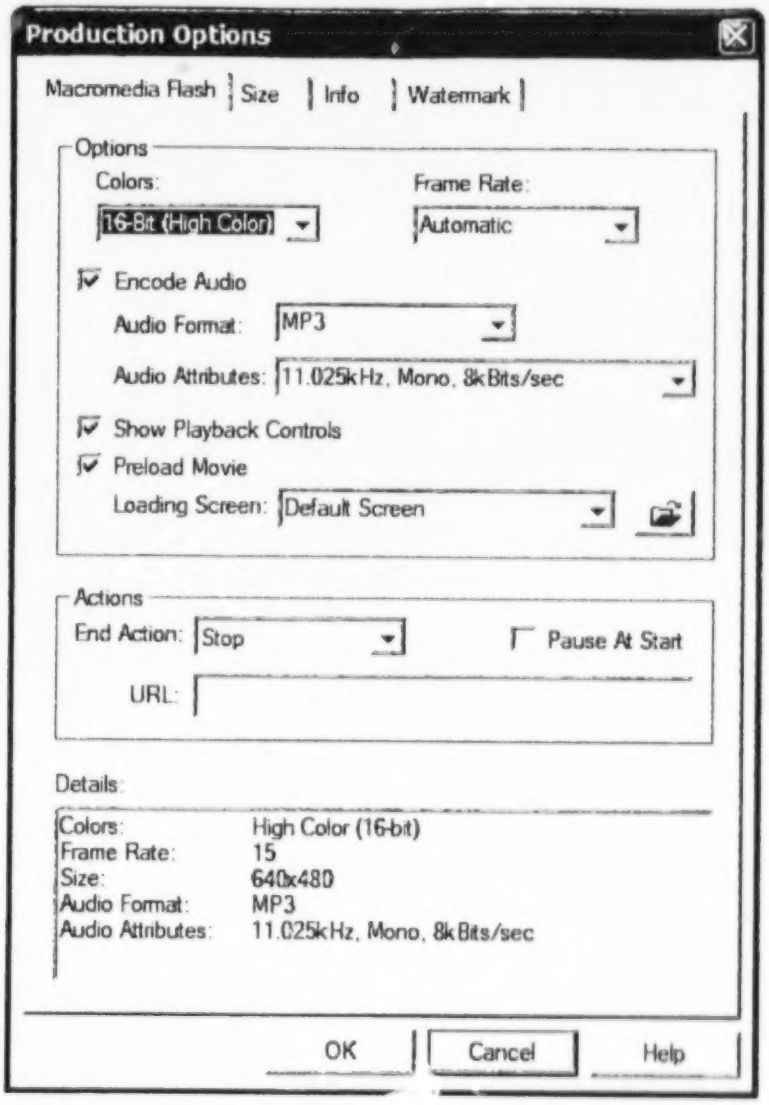

Figure 4. Camtasia Producer – Produce Movie – Production Options application window.

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